copolymers formed have a particle size of greater than 840 μm and 10% or less of the graft particles formed have a particle size of 100 μm or less.

## REMARKS

Claims 1-22 are active in the present application. The claims have been amended for clarity. The amendment to the original claims is not intended to further limit the claimed invention. Claims 21 and 22 are new claims. Support for the new Claims is found in Examples 1 and 2. The specification has been amended on pages 9 and 14 to correct obvious typographical errors. No new matter is added.

## REQUEST FOR RECONSIDERATION

Applicants thank Examiner Asinovsky for the helpful and courteous discussion of February 26, 2003. During the discussion, Applicants' U.S. representative noted that the presently claimed invention requires the discharge of a polymer latex into a stirring tank in a manner so that the direction of the discharge of the polymer latex faces in the same direction as the flow in the stirring tank. Further, it was discussed that the cross-sectional surface area of the discharge pipe for adding the polymer latex into the stirring pipe must be at least 40 $mm^2$. The Examiner agreed that the prior art references relied upon by the Examiner do not explicitly disclose processes that meet these limitations.

The Examiner rejected the claims under 35 U.S.C. § 103(a) as obvious in view of a patent to Jiroumaru (U.S. 4,446,309) individually or in combination with Sugimori (U.S. 4,491,658). Jiroumaru describes a process in which the nozzles for feeding the latex and coagulant solutions are in an arrangement where they are preferably fixed facing each other (column 4, lines 30-31). This arrangement is described pictorially in Figures 1 and 2 of the

patent. As is readily apparent from these figures the fluid flow of the latex (5) and the coagulant solution (6) would not enter the stirring tank in a direction that is facing the direction of fluid flow. Instead, the solutions that enter the stirring tank from pipes (5) and (6) would enter the tank in directions that are perpendicular to the fluid flow.

The Jiroumaru process produces crumbs of particle size 10 to 20 mm (see Table 1, lines 22-23). The patent discloses the importance of producing crumbs which do not have fine particles (column 1, lines 35-41 and 52-60). In fact, the patent discloses that the prior art process includes forming particles and aggregating them so that the solid is free from fine particles (column 1, lines 18-19 and 11-12). In contrast, the presently claimed process produces "particles that have high bulk specific gravity and contain few coarse particles" (page 3, lines 8-9). As is demonstrated in Examples 1 and 2 on page 18 (see rows 9 and 10 of the Table), the presently claimed processes produce particle mixtures containing few particles of diameter greater than 0.840 mm (only 3% and 13% of the particles are larger than 0.840 mm for Examples 1 and 2 respectively) and few particles of particle size less than 0.100 mm (only 10% and 7% of the particles are smaller than 0.1 mm for Examples 1 and 2 respectively). Applicants submit that the presently claimed process cannot be obvious in view of Jiroumaru as demonstrated by the fact that the claimed process produces solid coagulated latex polymers of different particle size and different particle size distribution.

New Claims 21 and 22 limit the particle size distribution of the particles of the graft copolymer formed by the processes of independent Claims 1 and 9.

Sugimori describes a process wherein an emulsified latex is added to a coagulant solution through "fine tubes" (Abstract). The emulsified latex is "gently discharged without forced injection into a coagulation liquid from fine tubes, slits, dies, etc." (column 3, lines 22-24). The Sugimori patent provides a number of Examples wherein the diameter of the fine

tubes is disclosed. In none of these examples is a nozzle disclosed that has a cross-sectional surface area of 40 $mm^2$ or greater (see column 7, lines 10-12; column 8, lines 30-31; column 8, lines 57-59; column 9, lines 32-33; column 9, lines 57-58; column 10, lines 35-36; column 11, lines 7-8; column 11, lines 25-26; column 11, lines 40-41; column 11, lines 53-54; column 11, line 68 through column 12, line 1; column 12, lines 21-22; column 12, lines 34-35; column 12, lines 49-50; column 13, lines 7-8; column 13, line 46; column 14, lines 27-28; column 15, line 40; column 16, line 26; column 17, lines 36-37; and column 18, lines 25-26).

Applicants submit that the presently claimed invention wherein the cross-sectional surface area of the discharge portion of the nozzle used to discharge the polymer latex into the stirring tank must be greater than 40 $mm^2$ cannot be obvious in view of Sugimori where the emulsified latex is added to the stirring tank through fine tubes none of which are disclosed to be 40 $mm^2$ or greater in cross-sectional area.

Applicants submit that Jiroumaru's express teaching of adding the latex-containing fluid in an orientation perpendicular to the flow inside the tank and Sugimori's express teaching of adding the latex through fine tubes, cannot render the presently claimed invention obvious since both references contain disclosure directly contrary to the limitations of present Claim 1 (see MPEP §2141.02 - "Prior Art Must Be Considered In Its Entirety, Including Disclosures That Teach Away From The Claim"; and MPEP §2145(X)(D)(2) - "References Cannot Be Combined Where Reference Teaches Away From Their Combination").

With regard to independent Claim 9 and dependent Claim 3, neither Jiroumaru nor Sugimori disclose a process that includes slurry particle crushing. Slurry particle crushing is disclosed to provide crushing of mainly particles of a fixed particle size or larger (page 10, lines 9-13). Figures 1 and 2 describe a soft crusher used for slurry particle crushing. No such slurry particle crushing is disclosed or suggested by the prior art references relied upon by the

Examiner.

The effect of slurry particle crushing on particle size distribution is evidenced by Examples 1 and 2. In comparison to Example 2, where slurry particle crushing is not included, the process of Example 1 (which includes slurry particle crushing) is able to provide a lesser amount of particles greater than 0.840 mm in diameter (3% vs. 13%) while generating only a small amount of additional particles that are 0.1 mm or smaller (10% vs. 7%). A process including slurry particle crushing has therefore been demonstrated to provide a solid having a different particle size distribution in comparison to the solid produced without slurry particle crushing. Applicants submit that processes including slurry particle crushing are not anticipated or rendered obvious by Jiroumaru or Sugimori in view of the prior art's silence with regard to slurry particle crushing and the differences in particle size and particle size distribution of the coagulated latex obtained by the claimed process in comparison to the prior art coagulated latex.

Applicants respectfully request the withdrawal of the rejection under 35 U.S.C. § 103(a) in view of Jiroumaru, individually or in combination with Sugimori.

The Office further rejected the claims as obvious in view of the combination of JP 60-127312 and Yasui (U.S. 4,792,490). Applicants note that the English abstract of JP 60-127312 discloses that a latex of thermoplastic resin is delivered into a coagulating solution through a "nozzle having many capillaries." In "The Random House College Dictionary, Unabridged Edition" J.P. Stein, editor, Random House, Inc. (1972), page 200, capillary is defined as "pertaining to or occurring in or as in a tube of fine bore." Nowhere in the English Abstract of JP 60-127312 is it disclosed or suggested that the latex is added to a stirring tank through a nozzle having a cross-sectional area of at least 40 $mm^2$. Moreover, nowhere in JP 60-127312 or Yasui is it taught or suggested that a latex of different particle size

characteristics can be obtained by discharging a latex into a stirred tank through a pipe of large cross-sectional area.

The disclosure in the English Abstract of JP 60-127312 that a latex is added to a coagulant through a nozzle having many capillaries teaches away from the presently claimed invention wherein the polymer latex is discharged into a stirring tank through an immersed nozzle having a cross-sectional surface area of at least 40 $mm^2$ in a direction that is facing the direction of the fluid flow in the stirred tank. Applicants submit that the disclosure of JP 60-127312 teaches away from the presently claimed invention (Claim 1) and its combination with the other prior art cited is inappropriate (see MPEP §2141.02 - "Prior Art Must be Considered In Its Entirety, Including Disclosures That Teach Away From The Claim"; and MPEP §2145(X)(D)(2) - "References Cannot Be Combined Where Reference Teaches Away From Their Combination").

As discussed above, the presently claimed method provides particles of different particle size and particle size distribution than the prior art processes (see new dependent Claims 21 and 22). Yasui discloses that the prior art method is suitable for obtaining particles with a grain diameter of from 200 μm to 1 cm (column 7, lines 35-38) and that an average particle size of from 1 mm to 10 mm is preferred (column 12, lines 65-68). Neither JP 60-127312 nor Yasui disclose that the particle size distribution may be changed by reducing the amount of particles that are greater than 840 μm (0.84 mm) and less than 100 μm (0.1 mm) as demonstrated for the presently claimed process. Applicants submit that the presently claimed processes cannot be obvious in view JP 60-127312 and/or Yasui since the prior art processes favor the production of latex solids having particle size characteristics different from the particles formed by the claimed process.

With regard to present dependent Claim 3 and independent Claim 9, neither the

English abstract of JP 60-127312 nor the Yasui reference describe the inclusion of slurry particle crushing. The claimed invention (Claims 3 and 9) cannot be obvious in view of the prior art of record since at least one of the present claim limitations is not disclosed or described in the prior art relied upon by the Examiner. As discussed earlier, the slurry particle crushing reduces the amount of coarse particles to an extent greater than any concomitant increase in the amount of fine particles. No such slurry particle crushing is disclosed for the processes of JP 60-127312 or Yasui.

Applicants submit the presently claimed invention is not obvious in view of the prior art relied upon by the Examiner, as evidenced by the difference in particle size and particle size distribution obtained by the claimed process (see discussion above) and further in view of the fact that none of the prior art references disclose slurry particle crushing.

Applicants respectfully request the withdrawal of the rejections and the passage of all now-pending claims to issue.

Respectfully submitted,

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IN THE SPECIFICATION

Please replace the paragraph on page 14, lines 15-23 with the following paragraph.

A coagulation step, slurry particle crushing step and solidification step were carried out using a continuous tank coagulation process consisting of an overflow stirring tank having an internal volume of 1.5 $m^3$ (coagulation tank, equipped with a [Fowler??] Faudler vane having an inner diameter of 1.4 m and vane diameter of 0.9m), a soft crusher coupled downstream from this overflow stirring tank with a pipe from the overflow port of this stirring tank (Komatsu Zenoah Co., "KD125MS" Disintegrator, Figs. 1 and 2) and two 3 $m^2$ overflow stirring tanks coupled downstream from this soft crusher (first and second solidification tanks, equipped with a Faudler vane having an inner diameter of 1.6 m and vane diameter of 1 m).

Please replace the paragraph on page 9, lines 2-6 with the following paragraph.

When hard, inelastic polymer latex (B) is added in this manner, not only is the mixed state of highly concentrated slurry in the stirring tank improved, but also the hard, inelastic polymer covers the surface of the [graph] graft polymer particles, thereby making it possible to improve the fluidity, blocking resistance and other powder characteristics of the resulting graft polymer particles.

## IN THE CLAIMS

1. (Amended) A [production] method [of polymer particles which producing graft polymer particles by contacting a coagulant with a polymer latex (A) obtained by graft polymerizing a monomer containing methylmethacrylate to a rubber-like polymer;] comprising

discharging a polymer latex [the method having a coagulation step in which polymer latex (A) is discharged] into a stirring tank from an immersed nozzle [provided so that] wherein the cross-sectional surface area of [the] a discharge portion of the nozzle is 40 mm2 or more, [and] the direction of discharge of the polymer latex is [facing in] the same direction as the flow in the stirring tank and [so that] the linear velocity at the nozzle outlet is [a velocity of] 50-350 mm/s, [and contacted] to contact the polymer latex with a coagulant to coagulate the graft polymer and [obtain] form a slurry liquid; and

solidifying the [a solidification step in which the resulting] slurry liquid [is held] at a temperature of 60-100°C [to solidify the coagulated graft polymer] wherein the polymer latex is a graft polymer comprising methyl methacrylate units grafted onto a rubber-like polymer, to form particles of the graft copolymer.

2. (Amended) The method [A production method of polymer particles] according to claim 1, [wherein] further comprising

adding a hard, inelastic polymer latex (B) having a glass transition temperature of 50°C or higher [is added at the stage] prior to [the coagulation step and/or solidification step] any of discharging or solidifying.

3. (Amended) The method [A production method of polymer particles] according to claim 1, [wherein a] further comprising

slurry particle crushing [step, in which slurry liquid obtained in the coagulation step is

formed into a creamy slurry liquid free of coarse particles, is] carried out between [the coagulation step and the solidification step] discharging and solidifying, wherein the slurry liquid is formed into a creamy slurry liquid free of worse particles.

4. (Amended) The method [A production method of polymer particles] according to claim 2, [wherein a] further comprising

slurry particle crushing [step, in which slurry liquid obtained in the coagulation step is formed into a creamy slurry liquid free of coarse particles, is] carried out between [the coagulation step and the solidification step] discharging and solidifying, wherein the slurry liquid is formed into a creamy slurry liquid free or worse particles.

5. (Amended) The method [A production method of polymer particles] according to claim 3, wherein [the] slurry particle crushing [step is carried out under conditions in which] crushes particles in the slurry liquid [are crushed] at a shear rate of 10,000-500,000/s.

6. (Amended) The method [A production method of polymer particles] according to claim 4, wherein [the] slurry particle crushing [step is carried out under conditions in which] crushes particles in the slurry liquid [are crushed] at shear rate of 10,000-500,000/s.

7. (Amended) The method [A production method of polymer particles] according to claim 5, wherein the shear rate is greater than 10,000/s and less than or equal to 500,000/s.

8. (Amended) The method [A production method of polymer particles] according to claim 6, wherein the shear rate is greater than 10,000/s and less than or equal to 500,000/s.

9. (Amended) A [production] method [of polymer particles that is a method of producing graft polymer particles comprising contacting a coagulant with a polymer latex (A) obtained by graft polymerizing a monomer containing methylmethacrylate to a rubber-like polymer, the method] comprising:

[a coagulation step in which] contacting a polymer latex (A) [is contacted] comprising

a graft copolymer with a coagulant to coagulate the graft polymer and obtain a slurry liquid; followed by,

[a] slurry particle crushing [step in which the slurry liquid obtained in the coagulation step] wherein the slurry liquid is formed into a creamy slurry liquid free of coarse particles; and,

[a solidification step] solidifying in which the slurry liquid [obtained in the slurry particle crushing step] is held at a temperature of 60-100 C to solidify the graft polymer.

10. (Amended) The method [A production method of polymer particles] according to claim 9, [wherein] further comprising

adding a hard, inelastic polymer latex (B) having a glass transition temperature of 50 C or higher [is added at the stage] prior to [the coagulation step and/or solidification step] contacting or solidifying.

11. (Amended) The method [A production method of polymer particles] according to claim 9, wherein the graft polymer solid concentration in the slurry [in the stirring tank in the coagulation step] during discharging is 20-30% by weight.

12. (Amended) The method [A production method of polymer particles] according to claim 10, wherein the graft polymer solid concentration in the slurry [in the stirring tank in the coagulation step] during discharging is 20-30% by weight.

13. (Amended) The method [A production method of polymer particles] according to claim 9, wherein [the slurry particle crushing step is carried out under conditions in which] the particles in the slurry liquid are crushed at a shear rate of 10,000-500,000/s.

14. (Amended) The method [A production method of polymer particles] according to claim 10, wherein the [slurry particle crushing step is carried out under conditions in which] particles in the slurry liquid are crushed at shear rate of 10,000-500,000/s.

15. (Amended) The method [A production method of polymer particles] according to claim 11, wherein the [slurry particle crushing step is carried out under conditions in which] particles in the slurry liquid are crushed at shear rate of 10,000-500,000/s.

16. (Amended) The method [A production method of polymer particles] according to claim 12, wherein the [slurry particle crushing step is carried out under conditions in which] particles in the slurry liquid are crushed at shear rate of 10,000-500,000/s.

17. (Amended) The method [A production method of polymer particles] according to claim 13, wherein the shear rate is greater than 10,000/s and less than or equal to 500,000/s.

18. (Amended) The method [A production method of polymer particles] according to claim 14, wherein the shear rate is greater than 10,000/s and less than or equal to 500,000/s.

19. (Amended) The method [A production method of polymer particles] according to claim 15, wherein the shear rate is greater than 10,000/s and less than or equal to 500,000/s.

20. (Amended) The method [A production method of polymer particles] according to claim 16, wherein the shear rate is greater than 10,000/s and less than or equal to 500,000/s.